

WHAT IS CLAIMED IS:

1. A bearing apparatus for a wheel of vehicle comprising:
 - an axle housing "H" supported under a body of vehicle;
 - a hollow driving shaft "D/S" inserted into the axle housing "H"; and
 - a wheel bearing arranged between the driving shaft "D/S" and an opening of the axle housing "H" and structured as a unit of a hub wheel (1, 14) and a double row rolling bearing (2, 15); the wheel bearing comprising:
 - an inner member (3, 16) including a hub wheel (1, 14) integrally formed on one end thereof with a wheel mounting flange (6) and having an axially extending cylindrical portion (7); and inner rings (10) press-fitted onto the cylindrical portion (7) of the hub wheel (1, 14) and formed on which outer circumferential surface with at least one of inner raceway surfaces (10a);
 - an outer member (4) arranged around the inner member (3, 16) and formed with double row outer raceway surfaces (4a) on its inner circumferential surface oppositely to the inner raceway surfaces (10a);
 - double row rolling elements (5) arranged between the inner and outer raceway surfaces (10a, 4a) of the inner member (3, 16) and the outer member (4);
 - a cage (11) for freely rollably holding the rolling elements (5); and
 - seals (12 and 13) for sealing an annular space between the inner member (3, 16) and the outer member (4);
 - characterized in that a cap (9, 17, 21, 26, 27', 29) having metal core (9a, 18, 21a, 29a) of steel is press-fitted into an end of central bore of the hub wheel (1, 14).
2. A bearing apparatus for a wheel of vehicle of claim 1 wherein said at least one (14a) of inner raceway surfaces (10a) is formed directly on the outer circumferential surface of the hub wheel (1, 14).
3. A bearing apparatus for a wheel of vehicle of claim 1 wherein the end

of said cylindrical portion (7) is plastically deformed radially outward to form a caulked portion (13) for preventing the inner ring (10) from being slipped off from the cylindrical portion (7) of the hub wheel (1, 14).

4. A bearing apparatus for a wheel of vehicle of claim 3 wherein the outer circumferential region of the wheel mounting flange (6) from its base of inboard side to the cylindrical portion (7) is hardened by high frequency induction hardening as having the surface hardness 54~64 HRC, and the caulked portion (13) is remained unhardened as having the surface hardness of 25 HRC or less after forging.

5. A bearing apparatus for a wheel of vehicle of claim 1 wherein said cap (9, 17, 21, 26, 27', 29) is press-fitted into the central bore of the wheel mounting flange (6) of hub wheel (1, 14).

6. A bearing apparatus for a wheel of vehicle of claim 1 wherein said cap (9, 17, 21, 26, 27', 29) comprises a metal core (9a, 18, 21a, 29a) of steel having a cross-section of substantially "C" configuration and an elastic member (9b, 19, 21b, 29b) attached to at least part of its fitting portion.

7. A bearing apparatus for a wheel of vehicle of claim 6 wherein said cap (9, 17, 21, 26, 27', 29) is press-fitted so that the circumferential edge of its fitting portion is oriented toward the outboard side.

8. A bearing apparatus for a wheel of vehicle of claim 6 wherein said circumferential edge of the fitting portion of the metal core (9a, 18, 21a, 29a) is formed with a bead (18a) extending radially outward, and an annular groove (20) with which the bead (18a) engages is formed on the central bore of the hub wheel (1, 14).

9. A bearing apparatus for a wheel of vehicle of claim 6 wherein said cap (9, 17, 21, 26, 27', 29) is limited against an axial movement by steps (22, 23) provided at either sides of the cap (9, 17, 21, 26, 27', 29).

10. A bearing apparatus for a wheel of vehicle of claim 1 wherein said cap (26) comprises a metal core of steel having a cross-section of

substantially "C" configuration, an annular recess (25) is formed on the inner circumferential surface of the hub wheel (1, 14), and the fitting portion of the cap (26) is formed with a projection (26a) adapted to be engaged with the annular recess (25).

11. A bearing apparatus for a wheel of vehicle of claim 10 wherein said projection (26a) is formed by plastic deformation after the cap (27') has been press-fitted into the bore of the hub wheel (1, 14).

12. A bearing apparatus for a wheel of vehicle of claim 1 wherein said cap (9, 17, 21, 26, 27', 29) is press-fitted with a interference of 0.05~0.3 mm.